

CLAIMS

1. A method of supporting Hierarchical Mobile IP version 6 (HMIPv6) service for a mobile node, characterized by authenticating and authorizing the mobile node for HMIPv6 service based on an AAA infrastructure.
2. The method of claim 1, characterized in that said mobile node is roaming in a visited network and the AAA infrastructure is linking the visited network with the home network of the mobile node.
3. The method of claim 1 or 2, characterized by transferring HMIPv6-related information required for authenticating and authorizing the mobile node for HMIPv6 service over said AAA infrastructure.
4. The method of claim 3, characterized in that said HMIPv6-related information comprises information selected from the group of HMIPv6 authentication, authorization and configuration information.
5. The method of claim 3, characterized by transferring HMIPv6-related information over said AAA infrastructure for establishing a HMIPv6 security association between the mobile node and a Mobility Anchor Point (MAP).
6. The method of claim 5, characterized by transferring HMIPv6-related information over said AAA infrastructure for establishing a HMIPv6 binding for the mobile node.
7. The method of claim 6, characterized by transferring HMIPv6-related information for HMIPv6 binding in the same round trip as HMIPv6-related information for HMIPv6 security association.

8. The method of claim 3, characterized by transferring HMIPv6-related information in an authentication protocol in an end-to-end procedure between the mobile node and an AAA home network server (AAAh).
- 5 9. The method of claim 8, characterized in that said authentication protocol is an extended authentication protocol.
- 10 10. The method of claim 9, characterized in that said extended authentication protocol is an extended Extensible Authentication Protocol (EAP), and said HMIPv6-related information is incorporated as additional data in the EAP protocol stack.
- 15 11. The method of claim 10, characterized in that said HMIPv6-related information is transferred as EAP attributes in the EAP method layer of the EAP protocol stack.
12. The method of claim 10, characterized in that said HMIPv6-related information is transferred in a generic container in the EAP protocol stack.
- 20 13. The method of claim 10, characterized in that the extended EAP protocol is carried by PANA, PPP or IEEE 802.1X between the mobile node and an AAA client in the visited network, and by a Diameter or Radius application within the AAA infrastructure.
- 25 14. The method of claim 8, characterized in that a MAP is located in the home network, and HMIPv6-related information is transferred between the mobile node and an AAA home network server (AAAh) in the authentication protocol, and HMIPv6-related information is transferred between the AAAh and the MAP in a separate session of the authentication protocol or within an AAA framework protocol application.

15. The method of claim 8, characterized in that a MAP is located in the visited network, and HMIPv6-related information is transferred between the mobile node and an AAA home network server (AAAh) within said authentication protocol, and HMIPv6-related information is transferred between the AAAh and the MAP in the visited network within an AAA framework protocol application.
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16. The method of claim 15, characterized in that said AAA framework protocol application is a Diameter or Radius application adapted for HMIPv6.
- 10 17. The method of claim 3, characterized in that said HMIPv6-related information is transferred in an AAA framework protocol application.
18. The method of claim 17, characterized in that said AAA framework protocol application is a Diameter or Radius application adapted for HMIPv6.
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19. The method of claim 1 or 2, characterized by said AAA infrastructure assigning a Mobility Anchor Point (MAP) to the mobile node.
- 20 20. The method of claim 19, characterized in that an AAA infrastructure component of the home network generates credential-related data for security association between the mobile node and the assigned MAP and sends said credential-related data to the MAP, the AAA infrastructure home network component generates information for finalizing the security association or the MAP responds with information for finalizing the security association to the AAA infrastructure home network component, which sends HMIPv6 authorization information to the mobile node over the AAA infrastructure.
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- 30 21. The method of claim 19, characterized in that said MAP is located in the home network of the mobile node and an AAA home network server (AAAh) performs MAP assignment, and the AAA home network server (AAAh) generates

credential-related data for security association between the mobile node and the assigned MAP and sends said credential-related data to the MAP, the AAAh generates information for finalizing the security association or the MAP responds with information for finalizing the security association to the AAAh, and the AAAh sends

5 HMIPv6 authorization information including MAP assignment information, binding address information and security association information to the mobile node over the AAA infrastructure.

22. The method of claim 19, characterized in that said MAP is located in the visited network and an AAA visited network server (AAAv) performs MAP assignment, and the mobile node sends a MAP assignment request to an AAA home network server (AAAh) over the AAA infrastructure, and the AAAh forwards the MAP assignment request to the AAA visited network server (AAAv), and the AAA home network server generates credential-related data for security association between

10 the mobile node and the assigned MAP, said credential-related data being transferred from the AAAh to the MAP via the AAAv, the AAAh generates information for finalizing the security association or the MAP responds with information for finalizing the security association to the AAAh via the AAAv, and the AAAh sends HMIPv6 authorization information including MAP assignment information, binding address

15 information and security association information to the mobile node over the AAA infrastructure.

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23. The method of claim 1, characterized by simultaneously accommodating HMIPv6 and MIPv6 authentication and authorization in the same round trip over said AAA infrastructure.

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24. A system for supporting Hierarchical Mobile IP version 6 (HMIPv6) service for a mobile node, characterized by means for authenticating and authorizing the mobile node for HMIPv6 service based on an AAA infrastructure.

25. The system of claim 24, characterized in that said mobile node is roaming in a visited network and the AAA infrastructure is linking the visited network with the home network of the mobile node.

5 26. The system of claim 24 or 25, characterized by means for transferring HMIPv6-related information required for authenticating and authorizing the mobile node for HMIPv6 service over said AAA infrastructure.

10 27. The system of claim 26, characterized in that said HMIPv6-related information comprises information selected from the group of HMIPv6 authentication, authorization and configuration information.

15 28. The system of claim 26, characterized by means for transferring HMIPv6-related information over said AAA infrastructure for establishing a HMIPv6 security association between the mobile node and a Mobility Anchor Point (MAP).

20 29. The system of claim 28, characterized by transferring HMIPv6-related information over said AAA infrastructure for establishing a HMIPv6 binding for the mobile node.

25 30. The system of claim 29, characterized by means for transferring HMIPv6-related information for HMIPv6 binding in the same round trip as HMIPv6-related information for HMIPv6 security association.

30 31. The system of claim 26, characterized in that HMIPv6-related information is transferred within an authentication protocol in an end-to-end procedure between the mobile node and an AAA home network server (AAAh).

35 32. The system of claim 31, characterized in that said authentication protocol is an extended authentication protocol.

33. The system of claim 32, characterized in that said extended authentication protocol is an extended Extensible Authentication Protocol (EAP), and said HMIPv6-related information is incorporated as additional data in the EAP protocol stack.

5 34. The system of claim 33, characterized in that said HMIPv6-related information is transferred as EAP attributes in the EAP method layer of the EAP protocol stack.

10 35. The system of claim 33, characterized in that said HMIPv6-related information is transferred in a generic container in the EAP protocol stack.

15 36. The system of claim 33, characterized in that the extended EAP protocol is carried by PANA, PPP or IEEE 802.1X between the mobile node and an AAA client in the visited network, and by a Diameter or Radius application within the AAA infrastructure.

20 37. The system of claim 31, characterized in that a MAP is located in the home network, and HMIPv6-related information is transferred between the mobile node and an AAA home network server (AAAh) in the authentication protocol, and HMIPv6-related information is transferred between the AAAh and the MAP in a separate session of the authentication protocol or within an AAA framework protocol application.

25 38. The system of claim 31, characterized in that a MAP is located in the visited network, and HMIPv6-related information is transferred between the mobile node and an AAA home network server (AAAh) within said extended authentication protocol, and HMIPv6-related information is transferred between the AAAh and the MAP in the visited network within an AAA framework protocol application.

39. The system of claim 38, characterized in that said AAA framework protocol application is a Diameter or Radius application adapted for HMIPv6.
40. The system of claim 26, characterized in that said HMIPv6-related information is transferred in an AAA framework protocol application.
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41. The system of claim 40, characterized in that said AAA framework protocol application is a Diameter or Radius application adapted for HMIPv6.
42. The system of claim 24 or 25, characterized by said AAA infrastructure being configured for assigning a Mobility Anchor Point (MAP) to the mobile node.
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43. The system of claim 42, characterized in that an AAA infrastructure component of the home network comprises:
 - means for generating credential-related data for security association between the mobile node and the assigned MAP; and
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 - means for sending said credential-related data to the MAP, and receiving information from the MAP for finalizing the security association; and
 - means for sending HMIPv6 authorization information to the mobile node over the AAA infrastructure.
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44. The system of claim 42, characterized in that said MAP is located in the home network of the mobile node and an AAA home network server (AAAh) is configured for performing MAP assignment, and the AAA home network server (AAAh) further comprises:
 - means for generating credential-related data for security association between the mobile node and the assigned MAP;
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 - means for sending said credential-related data to the MAP, and receiving information from the MAP for finalizing the security association and binding address information;
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means for sending HMIPv6 authorization information including MAP assignment information, binding address information and security association information to the mobile node over the AAA infrastructure.

5 45. The system of claim 42, characterized in that said MAP is located in the visited network and an AAA visited network server (AAAv) is configured for performing MAP assignment, and the AAA home network server (AAAh) further comprises:

10 means for forwarding a MAP assignment request received over said AAA infrastructure from the mobile node to the AAA visited network server (AAAv);

means for generating credential-related data for security association between the mobile node and the assigned MAP;

15 means for sending said credential-related data to the MAP via the AAAv, and receiving, from the MAP via the AAAv, information for finalizing the security association and binding address information; and

means for sending HMIPv6 authorization information including MAP assignment information, binding address information and security association information to the mobile node over the AAA infrastructure.

20 46. The system of claim 24, characterized by means for simultaneously accommodating HMIPv6 and MIPv6 authentication and authorization in the same round trip over said AAA infrastructure.

25 47. An AAA home network server for supporting Hierarchical Mobile IP version 6 (HMIPv6) service for a mobile node, characterized by:

means for generating credential-related data for security association between the mobile node and an assigned Mobility Anchor Point (MAP); and

means for sending said credential-related data to the MAP, and receiving information from the MAP for finalizing the security association; and

means for sending HMIPv6 authorization information including security association information to the mobile node.

48. The AAA home network server of claim 47, characterized in that said mobile

5 node is roaming in a visited network, and said means for sending HMIPv6 authorization information is operable for sending the information over an AAA infrastructure linking the visited network with the home network of the mobile node.

49. The AAA home network server of claim 48, characterized in that said AAA

10 home network server is configured for receiving, from the MAP, information for finalizing the security association as well as binding address information, and said means for sending HMIPv6 authorization information over the AAA infrastructure is configured for sending HMIPv6 authorization information including MAP assignment information, binding address information and security association information to the

15 mobile node.

50. A Mobility Anchor Point (MAP) node for supporting Hierarchical Mobile IP version 6 (HMIPv6) service for a mobile node, characterized by:

means for interacting with an AAA home network server for supporting the
20 establishment of a security association between the mobile node and the MAP;

means for receiving credential-related data from the AAA home network server; and

means for sending information for finalizing the security association to the
AAA home network server.

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51. The MAP of claim 50, further characterized by means for assigning a binding address in said MAP in response to a binding update from the mobile node, and for establishing a HMIPv6 binding in said MAP based on the assigned binding address and address information received in the binding update.